UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00290

August 18, 2003

Hanh Gold
NEPA Compliance Coordinator
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Effects of the Gerber Road Bridge Installation Project for Foster Creek, Tributary to the Clackamas River, Clackamas County, Oregon (EPA No. OW-130)

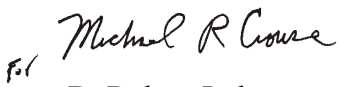
Dear Ms. Gold:

Enclosed is a biological opinion (Opinion) pursuant to section 7 of the Endangered Species Act (ESA) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries), on the effects of funding the proposed Gerber Road Bridge Installation Project in Clackamas County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Lower Columbia River steelhead (*Oncorhynchus mykiss*) Lower Columbia River chinook salmon (*O. tshawytscha*) and Upper Willamette River chinook salmon. As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This document also serves as consultation on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600.

If you have any questions regarding this consultation, please contact Ben Meyer of my staff in the Oregon Habitat Branch at 503.230.5425.

Sincerely,



D. Robert Lohn
Regional Administrator

cc: John Barco, COE
Steve Maltby, Clackamas County

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Gerber Road Bridge Installation Project for Foster Creek,
Tributary to the Clackamas River,
Clackamas County, Oregon
(EPA No. OW-130)

Agency:	Environmental Protection Agency
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	August 18, 2003
Issued by:	for Michael R Course _____ D. Robert Lohn Regional Administrator
Refer to:	**2003/00290**

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1. INTRODUCTION

1.1 Background and Consultation History

On July 7, 2003, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a request and biological assessment (BA) from the Environmental Protection Agency (EPA) requesting Endangered Species Act (ESA) section 7 formal consultation for the Gerber Road Bridge Installation Project over Foster Creek, a tributary of the Clackamas River in Clackamas County, Oregon. The proposed action is to provide funding to Clackamas County (County) to remove a failing culvert and install a full-span bridge over Foster Creek.

The effects determination was made using the methods described in *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NOAA Fisheries 1996). EPA determined that the proposed action was likely to adversely affect Lower Columbia River (LCR) steelhead (*Oncorhynchus mykiss*), LCR chinook salmon (*O. tshawytscha*) and Upper Willamette River (UWR) chinook salmon.

NOAA Fisheries listed LCR steelhead as threatened under the ESA on March 19, 1998 (63 FR 13347). NOAA Fisheries listed LCR and UWR chinook salmon as threatened on March 24, 1999 (64 FR 14308). NOAA Fisheries issued protective regulations for all three Evolutionarily Significant Units (ESU) under section 4(d) of the ESA on July 10, 2000 (65 FR 42422).

This biological opinion (Opinion) is based on the information presented in the biological assessment (BA) and the result of the consultation process. The consultation process involved correspondence and communications to obtain additional information and clarify information in the BA. The objective of this Opinion is to determine whether the action to replace a culvert with a bridge over Foster Creek is likely to jeopardize the continued existence of the LCR steelhead, LCR chinook salmon or UWR chinook salmon.

1.2 Proposed Action

The proposed action is the removal of an existing culvert under Gerber Road and replacing it with a bridge. The following is a synopsis of the proposed action as described in the BA.

The crossing at Gerber Road is currently an 8-foot by 6-foot by 105-foot long arched culvert at a 1.3% slope. The existing culvert was constructed in 1938, and is considered to be failing. The County received funding from the EPA to replace the culvert with a 20-foot, 4-inch by 17-foot, 9-inch galvanized steel squash-bottomed culvert. The culvert was to be 140 feet long, at a 1.1% slope, and embedded over three feet below the streambed. The goal of the culvert replacement was to improve fish passage.

In light of a structural failure downstream at the Bakers Ferry Road crossing, the County decided that review of the design of the proposed Gerber Road culvert was warranted. The County concluded that a bridge would be a better solution for Gerber Road. As such, the proposed plan

is to install a 26-foot wide by 100-foot long bridge over the creek. The bridge deck will be supported by two bents that will be installed well above the ordinary high water elevation. Each bent will be made of six steel piles (HP10x57) that will be driven approximately 17 feet below the elevation of ordinary high water. Class 200 riprap will be placed below grade along the toe of each newly established bank for a distance of approximately 120 feet to ensure long-term stability. The structure will have 14-foot long wing walls constructed at either end of the bridge. Stormwater on the bridge will be routed through swales for treatment before entering the stream

The new channel will have approximately 2:1 side slopes. These slopes will be stabilized with geotextile erosion control matting and seeded with the following mix: Blue wild rye (1 lb/1000 ft^2), red fescue (1 lb/1000 ft^2), slender wheatgrass (lb/1000 ft^2), and California brome (1 lb/1000 ft^2).

The seed will be broadcast onto the surface of the installed erosion matting and then swept into the interstices of the mat. In the fall, the area above the retaining walls will be planted with the trees and shrubs. These trees and shrubs will be installed through the mat by cutting a hole large enough for each tree or shrub.

Creek and Wetland Impacts

No wetlands will be affected by the proposed bridge construction. Approximately 367 cubic yards of native material will be removed to form the new banks and three cubic yards of concrete will be removed when the existing culvert is removed. Approximately 140 cubic yards of riprap will be placed below grade along the toe of each slope.

The first phase of the project, bridge construction, can be completely accomplished above the ordinary high water elevations. Therefore, the first phase can be initiated before the beginning of the in-water work period. The second phase, the removal of the existing culvert, can only be accomplished within the in-water work period, July 15th through August 31st.

Proposed Construction Methods

The construction of the Gerber Road bridge can be completed in two phases. The first phase, which will not require any work in the water, is the construction of the bridge. The second phase is the removal of the existing culvert and restoration of the newly-graded slopes.

The contractor will first construct a temporary access road on the east side of Gerber Road. This temporary access road will be constructed from aggregate and will require the removal of six trees (four red alders less than six inches in diameter and two red alders less than twelve inches in diameter). Once the access road has been constructed, the contractor will install all erosion control measures to ensure there are no adverse effects to the creek. These will include silt fences and straw wattles, as illustrated in Appendix B of the BA.

The construction of the bridge will first require the excavation of an area on either side of the existing culvert down to the ordinary high water elevation. Although the excavation will be to the ordinary high water elevation, the creek will still be flowing within the interior of the

existing culvert and, therefore, will not come in contact with the excavation activity. Once sufficient material has been removed (approximately 367 cubic yards), riprap will be installed beneath the bed elevation of the creek to stabilize the toe of the newly created banks. All exposed slopes will be covered with an erosion control geotextile fabric. Once the riprap has been installed, the contractor will construct the bents by driving piles. The bridge deck with its new railing and wing walls will be placed on top of the bents.

The temporary access road will allow the contractor to remove the existing culvert. However, before the culvert can be removed, the stream must be diverted through a 36-inch diameter pipe. The diversion will be accomplished in the same way the stream was diverted for Bakers Ferry Road. The stream will be dewatered approximately 50 feet upstream of the culvert to approximately 50 feet downstream of the culvert. The creek will remain dewatered for a maximum of 20 days, the maximum time estimated to complete removal of the existing culvert. The County will notify ODFW at least two weeks in advance of the proposed dewatering.

Fish will be removed from the work area using methods recommended by ODFW and NOAA Fisheries before in-water construction begins. The removal methods will likely include the use of block nets, seines, or potentially backpack electroshockers. It is likely that electroshocking would be conducted by ODFW biologists. After fish have been removed from the work area, block nets will be placed across the width of the creek upstream and downstream of the existing culvert. This will ensure that no fish remain in the dewatering area.

Once the biologists are sure that no fish remain in the dewatering area, a temporary sandbag dam will be placed across the width of the stream channel upstream of the culvert, but downstream of the block net. The dam will allow the installation of a 3-foot diameter PVC or HDPE diversion pipe to capture all of the flow and to allow safe, downstream fish passage through the construction area.

The diversion pipe is of sufficient size to carry 25 cfs. The pipe will have water-tight joints and no projections or protrusions. For most of the construction activities, the pipe will lay on the streambed, with no significant bends and with a maximum gradient of 1V:2H. The pipe will be held in place with sandbags stacked on the outside as needed. During the course of construction, the pipe may occasionally have to be moved. To temporarily stop water flow and fish passage, a valve will be installed at the pipe's upstream end. Before moving the pipe, a screened pump will be used to ensure that flow is maintained downstream of the work area.

At the downstream end of the construction area, the pipe will empty into a pool. Preferably, the pool will be naturally occurring, but it may be necessary to construct one using sandbags. The outlet of the pipe will be placed in the pool to ensure that fish are not injured upon their exit.

Members of the construction crew will be assigned the responsibility of inspecting the pipe throughout the day. Their inspection will review that the inlet of the pipe is not blocked, the block nets are secure and in place, the sandbag dam is secure and in place, the pipe is not leaking, the pipe location is sufficiently removed from the construction activity to ensure that it will not be

damaged, and that the pool at the outlet contains sufficient water depth to safely allow fish to exit. Maintenance of the pipe through the construction period is a priority. If necessary, all construction activities will stop to ensure that fish are not harmed and that water flow is maintained.

Once the culvert has been removed, the contractor will make sure the streambed is completely restored and clear of all debris. Before permanently restoring flow in the channel, the regulatory agencies will be notified and invited to the construction site to inspect the streambed. It is anticipated that water flow will be reestablished through the channel for at least eight hours before allowing fish to pass through the area.

Once the flow has been restored, the temporary access road will be removed and the construction of the bridge will be completed. The erosion control fabric will be seeded and planted in the fall, as described above.

Monitoring

For the prescribed monitoring period, the trees and shrubs installed within the planting areas will be monitored to ensure that at least 80% survive. Stem counts will be conducted on an annual basis. Photodocumentation from fixed locations will provide a visual record of structural changes during the monitoring period. An annual monitoring report that summarizes the above documentation will be submitted in late fall of each monitoring year to DSL, COE and NOAA Fisheries.

Performance Standards

The success of riparian restoration activities requires the establishment of a desirable woody plant community. The target goal for establishing woody species is 80% overall survival at the end of the required monitoring period. Replacement plantings will be required if the survival goals are not met.

Conservation Measures

Many conservation measures will be used to avoid or minimize impacts to listed species and their habitat during and after construction. A discussion of each of these measures is included below.

Erosion Control

To ensure protection of the water quality within Foster Creek, a Pollution and Erosion Control Plan will be prepared and carried out to prevent pollution related to construction operations. This plan will include the following content:

1. Practices to prevent erosion and sedimentation associated with the construction of an access road, stream crossing, the construction site, equipment and material storage sites, fueling operations and staging areas.
2. Practices to confine, remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.
3. A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

4. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.
5. Practices to prevent construction debris from dropping into Foster Creek and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

At a minimum, erosion control measures will be designed to keep turbidity below 10% ambient (background) conditions as measured 30 m (100 ft) downstream from the source. During construction, all erosion control measures will be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately. If inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately to make repairs, install replacements, or install additional controls as necessary. Sediment must be removed from erosion controls once it has reached 1/3 of the exposed height of the control. A written log will be maintained documenting all erosion control emergencies. This log will include the time the call was received, the corrective action undertaken, and the time the correction was completed. The log will be sent to the County at the end of each business day that an emergency call is made.

Erosion control measures shall include, but not be limited to the following:

1. Sediment detention measures, such as placement of weed-free straw bales and silt fences six-feet from the bottom of newly constructed slopes. Whenever straw bales are used, they will be staked and dug into the ground 12 cm (5 in).
2. Temporary plastic sheeting for immediate protection of open areas where seeding/ mulching are not appropriate.
3. Erosion control blankets or heavy duty matting, such as jute or coir, may be used on steep unstable slopes.
4. Biobags, weed-free straw bales and loose straw may be used for temporary erosion control. Temporary erosion and sediment controls will be used on all exposed slopes during any hiatus in work on exposed slopes.
5. On cut slopes steeper than 1:2 (v:h), a tackified seed mulch will be used so that the seed does not wash away before germination and rooting occurs. In steep locations, a hydro-mulch will be applied at 1.5 times the horizontal surface rate.
6. Material removed during excavation shall only be placed in locations where it cannot enter sensitive aquatic resources. Conservation of topsoil (removal, storage and reuse) will be employed.

<u>Water Quality / Hazardous Material</u>

The following shall be included as part of a Pollution Control Plan (PCP) that will be prepared by the Contractor to prevent point-source pollution entering Foster Creek:

1. No uncured concrete or water having had contact with newly poured concrete (within 24 hours of pour) shall come in contact with actively flowing waters. Moist burlap, or an approved equivalent will be used for concrete curing.

2. No pollutants of any kind (petroleum products, fresh concrete, silt, sandblasting material, welding slag, *etc.*) shall come in contact with an active flowing stream.
3. An oil-absorbing, floating boom shall be available on-site at all times and during the in-water work activity and will be kept on the bank.
4. Vehicle maintenance and storage of fuel shall be at least 150 feet from the ordinary high water elevation of Foster Creek. The area may only be used if it is sufficiently contained and presents no possibility for contamination.
5. No toxicant (including petroleum products) will be stored or transferred within 150 feet of the ordinary high water elevation of Foster Creek. Fuels and lubricants will be stored in a tank truck that will be regularly monitored for leakage. A spill control kit will be maintained onsite at all times.
6. "Diapering" of vehicles to catch any toxicants such as oils, grease, or brake fluid will be mandated when the vehicles have any potential to contribute toxic materials into Foster Creek.
7. Waste materials and spoils not utilized in the project will be removed from the site and disposed of in an appropriate upland location.
8. All contractor employees and subcontractors will be required to receive training in procedures to prevent erosion and spills.

Clearing and Grubbing

The following shall apply to activities associated with clearing and grubbing:

1. Work limits shall be clearly marked in the field prior to beginning work. No work outside the work limits shall be allowed without prior approval of the County.
2. Within the limited work areas, vegetation shall be cut off at ground level and roots left intact, excluding areas approved for grubbing.
3. Temporary access shall minimize impact to riparian vegetation, shall follow the recommendations of the professional arborist and be approved by the County prior to construction.

Project Timing

All work within the active channel of Foster Creek will be completed during the preferred in-water work period July 15th through August 31st, unless otherwise approved in writing by NOAA Fisheries.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

The listing status and biological information for LCR and UWR chinook salmon are provided in Myers *et al.* (1998). Listing status and biological information for LCR steelhead is described in Busby *et al.* (1996).

Foster Creek in the project area provides rearing, and migratory habitat for both adult and juvenile life stages of LCR and UWR chinook salmon, and LCR steelhead. It provides potential spawning habitat for LCR steelhead. Essential features of the area for the species are: (1) Substrate; (2) water quality; (3) water quantity; (4) water temperature; (5) water velocity; (6) cover/shelter; (7) food (juvenile only); (8) riparian vegetation; (9) space; and (10) safe passage conditions. The proposed action may affect the essential habitat features of water quality and riparian vegetation.

2.1.2 Evaluating Proposed Action

The standards for determining jeopardy and destruction or adverse modification of critical habitat are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations combined with the Habitat Approach (NMFS 1999): (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species and whether the action is consistent with the available recovery strategy; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors is likely to appreciably reduce the likelihood of species survival in the wild or destroy or adversely modify critical habitat. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmonids is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess to the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for the listed species to survive and recover to a naturally-reproducing population level, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration and rearing. Listed Pacific salmonid survival in the wild depends upon the proper functioning of certain ecosystem processes, including habitat

formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while removing adverse impacts of current practices. In conducting analyses of habitat-altering actions, NOAA Fisheries defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and applies a "habitat approach" to its analysis (NMFS 1999). The current status of the listed species covered by this Opinion, based upon their risk of extinction, has not significantly improved since they were considered for listing.

2.1.4 Environmental Baseline

In step 2 of NOAA Fisheries' analysis, we evaluate the relevance of the environmental baseline in the action area to the species' current status. The environmental baseline is an analysis of the effects of past and ongoing human-caused and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined by NOAA Fisheries regulations (50 CFR 402.02) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action". The action area for this project, therefore, includes the streambed and streambanks of Foster Creek from 100 feet upstream of Gerber Road downstream for an additional 300 feet.

The current population status and trends for LCR steelhead are described in Busby *et al.* (1996); for LCR and UWR chinook salmon in Myers *et al.* (1998). In general, the current status of these ESUs is the result of several long-term, human-induced factors (*e.g.,* habitat degradation, water diversions, hydropower dams) that serve to exacerbate the adverse effects of natural environmental variability from such factors as drought, floods, and poor ocean conditions.

Environmental baseline conditions within the action area were evaluated for the subject action at the project level and watershed scales. COE used the "matrix of pathways and indicators (MPI) described in "Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale"(NMFS 1996). This method assesses the current conditions of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species.

For Foster Creek, four of the 17 indicators evaluated were rated by COE as properly functioning. These were: Temperature, substrate, off-channel habitat, and floodplain connectivity. Nine indicators were rated as functioning "at risk". These were: Sediment/turbidity, chemical contamination/nutrients, fish passage/physical barriers, pool quality, refugia, streambank condition, road density and location, disturbance history, and riparian reserves. The large woody material, pool frequency, width/depth ratio and peak/base flows indicators were rated as not properly functioning. The environmental baseline conditions for each habitat indicator in the MPI are described in the BA and incorporated herein by reference. The following is a summary of the environmental baseline for Foster Creek as described in the BA.

Foster Creek is a tributary of the Clackamas River. Its watershed covers approximately 3.5 miles and lies entirely within strath terraces of the former Clackamas River. Elevations range from 128

feet to 554 feet NGVD. The lowest portion of the creek rests on and cuts through sandy, silty, and muddy facies of the indurated Troutdale Formation (Troutdale), which strongly constrains channel movement. The first 100 feet of the creek above the Clackamas River consists of a nearly vertical-walled gorge about 6 feet wide. The gradient of the stream is approximately 0.03 for the lowest portion cut into the Troutdale near the Clackamas River. At the upper end of the gorge is a waterfall over resistant, fine-grained beds of the Troutdale. At this point the stream drops approximately 6 feet within a horizontal distance of approximately 20 feet. Higher portions of the channel, which are on a resistant horizon of the Troutdale, have a gradient of 0.08 to the top of the waterfall. From this point to the top of the Troutdale-bedded reach, the stream has a linear gradient of 0.035.

About 100 feet downstream from Bakers Ferry Road, the creek rises out of its Troutdale bed into the most recent terraces. This terrace is unconsolidated with rounded cobbles of andesite and basalt matrix supported by coarse sands. This terrace extends for several hundred feet upstream from Bakers Ferry Road. The stream reach above this terrace traverses an older terrace of similar materials with a higher degree of weathering. At approximately 450 feet upstream from Bakers Ferry Road the stream assumes a reduced gradient of 0.005 until 1,650 feet above the road. A flat reach above this point has a gradient of 0.0026 for 600 feet. The portion of the stream from this point to the Gerber Road culvert has an average gradient of 0.013.

The portion of the stream in the immediate vicinity of Bakers Ferry Road has a bedload of coarse cobble. The reworked cobbles from the Clackamas terraces are well rounded and have a median diameter of 6 to 10 inches. In the vicinity of Bakers Ferry Road are a series of longitudinal bars, which continue upstream until the stream gradient is reduced. Where the stream gradient is reduced, the longitudinal bars are missing and the cobble size is much smaller. Step-pool morphology occurs in the upstream lower gradient reaches, but without the back-bar channels that appear to be an important component of the hydraulics at high flow with a water surface approximately 2 feet above the lowest portion of the channel.

Sediment movement within the channel at Bakers Ferry Road has been considerable following the construction of the crossing. Factors contributing to the movement of the bedload include the removal of the old culvert, the removal of gabions downstream of the crossing and the installation of log structures downstream of the gabions. The present channel is approximately 2 feet higher than the inverts at each end of the old culverts. It appears that cobble has been retained by the log structures that would otherwise have moved down the channel to the Clackamas River. The longitudinal bars in the immediate vicinity of the bridge appear to have moved significantly in the last year. The remnants of an old gabion downstream of the bridge are buried beneath a new bar that has recently formed along the wall of the Troutdale formation in the location of the former stream course.

The remobilization of cobbles within the channel is most apparent at points where the channel impinges on the terrace walls in the portion of the stream near Bakers Ferry Road. These points appear to be actively recruiting the coarsest sediment into the stream channel. Much of the finer fractions seem to be deposited away from the channel as back-bar overbank deposits, but the

coarsest fractions remain as intermittent bedload stored in bars along the channel. The downstream transport rate for the cobbles is unknown, but the installation of log structures downstream from Bakers Ferry Road near the time of bridge construction seems to have altered the transport regime for coarse cobbles through the lower portion of the stream into the Clackamas River. The log structures appear to have retained a significant portion of the cobble that would otherwise have been transported directly to the Clackamas River. Some of the apparent increase in coarse sediment transport may be related to the larger aperture at the bridge, but the coarse cobble deposition below the bridge seems to be relatively new. The large bar deposited around the mouth of Foster Creek in the Clackamas River may be the more usual resting place for coarse cobbles within the lower portion of Foster Creek since virtually no large woody debris exists in the channel to retard bedload movement. Large woody debris structures emplaced by ODFW attempt to recover the channel to a more natural historical condition.

The portions of Foster Creek near Bakers Ferry Bridge have a variably wide flood channel, but the elevation of the surface is rarely higher than 2 feet above the lowest portion of the channel. In the portions of the channel near Bakers Ferry Road, the bankfull depth seems to be twice that depth, or approximately 4 feet.

Coarse cobble is being recruited from the older upper strath terraces, although probably at a slower rate than from the lowest terrace. The visible cobble seems to be almost entirely located within the bankfull channel. Fine, silty fractions within the widest reach of the channel appear to be largely absent in the portion of Foster Creek below Bakers Ferry Bridge.

Sediment movement is expected to continue within the steeper portion of the channel between the log structures and the gradient change above the bridge. However, perturbations in channel morphology will likely not occur above this point. Bed movement near Gerber Road appears to be relatively minimal. A few pools in this area appear to have been formed by fallen western red cedars (*Thuja plicata*). The trees have fallen across the stream with little subsequent movement of the logs.

2.1.5 Analysis of Effects

2.1.5.1 Effects of Proposed Action

This effects analysis addresses effects to listed LCR steelhead, LCR chinook salmon and UWR chinook salmon that may result from this project given the conservation measures to be employed. These potential effects include reductions in water quality, changes in stream channel conditions and hydrology, and direct harm to fish.

Water Quality

The quality of the water that fish encounter on their migration is extremely important, and can determine such things as feeding and breeding success rates, disease levels, growth rates, and predation rates. Major elements of water quality critical to salmon are turbidity, suspended sediment, chemical contamination, and temperature. Turbidity and fine sediments can reduce prey

detection, alter trophic levels, reduce substrate oxygen, smother redds, and damage gills, as well as cause other deleterious effects. Chemical contamination can reduce fecundity and fertility, increase disease, shift biotic communities, and reduce the overall health of migrating salmon. Temperature affects metabolic rates, resistance to disease, oxygen concentrations in the water, and other vital factors.

The effects of suspended sediment and turbidity on fish, as reported in the literature, range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration.

The effects of suspended sediment and turbidity on fish, as reported in the literature, range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al*. 1980, Birtwell *et al*. 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (Sigler *et al*. 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd, 1987). The turbidity resulting from this in-water work will be limited in space and time, and to activities associated with removal of the culvert and placement of the riprap.

Stormwater from roads contains many chemicals known to cause harm to salmonids. Treatment to remove contaminants prior to discharge into a receiving body of water minimizes potential impacts. The proposed swales should prevent contaminants from reaching Foster Creek and aid in detaining water to minimize increased flow impacts.

Stream Channel Conditions

Channel conditions and dynamics are influenced by a number of processes. Changes in bank structure from the addition of hard structures such as riprap and the proposed gabions may directly affect channel condition and dynamics. Hard structures can adequately armor banklines at a single site, but simultaneously destroy or degrade other bankline features. By design, the hardening measures transfer and focus hydraulic forces to other areas. Nearshore topography is scoured, critical fish habitats can be degraded or destroyed, terrestrial habitat is lost, and erosion of neighboring property can be accelerated. The proposed wing walls and riprap may affect stream function along the bank line and contribute to stream channelization and loss of critical stream process. Monitoring of reaches downstream of the site to ensure that the addition of the wing

walls and riprap is not altering channel and bankline features should be conducted and any modifications repaired and causes rectified.

Stream Basin Hydrology
The removal of the existing culvert is likely to result in the stream coming back into equilibrium. This should aid in the long-term restoration of the reach to natural conditions.

Harm and Harassment
Direct harm to fish species may occur as a result of fish removal from the work area. The probability of harm is low because these activities would be conducted using containment measures and the work area would be isolated. In addition, all work requiring disturbance of the Foster Creek channel would be conducted during the preferred in-water work period, when fish presence is low. Within the isolated work area, fish removal would occur. Isolation of the work area could have direct effects to salmonids during the fish removal and relocation process. Mortality and/or injury to fish species may occur during handling. Potentially, delayed mortality could occur due to stress related to handling.

2.1.5.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation". The action area has been defined as the streambed and streambank of Foster Creek extending upstream 100 feet and downstream to the confluence of Foster Creek and the Clackamas River. A wide variety of actions occur within the Clackamas River watershed, within which the action area is located. NOAA Fisheries is not aware of any significant change in such non-federal activities that are reasonably certain to occur. NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years.

2.1.6 Conclusion

NOAA Fisheries has determined that, based on the available information, the proposed action is not likely to jeopardize the continued existence of LCR steelhead, LCR chinook salmon or UWR steelhead. NOAA Fisheries used the best available scientific and commercial data to analyze the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects.

This conclusion is based on the following conclusions: (1) Most of the proposed work will occur outside of the flowing waters of Foster Creek (*i.e.*, in the dry); (2) in-water work will be completed between July 15th and August 31st during a period of time when NOAA Fisheries expects presence of ESA-listed fish to be low, minimizing the likelihood of steelhead or chinook salmon presence in the action area due to low flow, and/or warm water conditions; (3) any increases in sedimentation and turbidity in the project reach of Foster Creek will be short-term and minor in scale, and would not change or worsen existing conditions for stream substrate in the action area; (4) the proposed

conservation measures are likely to minimize or avoid impacts associated with construction; and (5) the proposed action is not likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward proper functioning condition essential to long-term survival and recovery at the population ESU scale.

2.1.7 Reinitiation of Consultation

This concludes formal consultation on the Gerber Road Bridge Installation Project. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

2.2.1 Amount or Extent of Take

NOAA Fisheries anticipates that the action covered by this Opinion is reasonably certain to result in incidental take of steelhead and chinook salmon because of detrimental effects from increased sediment levels (non-lethal), the potential for direct incidental take during the work area isolation, and delayed mortality due to handling during the fish removal process. Effects of actions such as the placement of rock in the channel and increased sediment levels are largely unquantifiable in

the short term, and are not expected to be measurable as long-term harm to habitat features or by long-term harm to steelhead and chinook salmon behavior or population levels. Therefore, even though NOAA Fisheries expects some low-level incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take to the species itself. In instances such as these, the NOAA Fisheries designates the expected level of take as "unquantifiable". Based on the information in the BA, NOAA Fisheries anticipates that an unquantifiable amount of incidental take is reasonably certain to occur as a result of the actions covered by this Opinion.

In addition, NOAA Fisheries expects that the possibility exists for handling steelhead and chinook salmon juveniles during the work isolation process, which will result in incidental take to individuals during the construction period. NOAA Fisheries anticipates that incidental take of up to 30 juvenile UWR steelhead, LCR steelhead or LCR chinook salmon (27 non-lethal and 3 lethal) could occur as a result of the fish removal process due to dewatering and rewatering of the channel. The extent of the take is limited to UWR steelhead, LCR steelhead and LCR chinook salmon within the action area. The extent of the take is limited to the action area including the streambed and banks of Foster Creek 100 feet upstream of Gerber Road and downstream 300 feet.

2.2.2 Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of UWR steelhead and UWR chinook salmon resulting from the action covered by this Opinion. The EPA shall require measures that will:

1. Avoid or minimize incidental take from general construction by excluding unauthorized permit actions and applying permit conditions that avoid or minimize adverse effects to riparian and aquatic systems.
2. Ensure effectiveness of implementation of the reasonable and prudent measures by requiring that all erosion control measures and plantings for site restoration, shall be monitored and evaluated both during and following construction.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the EPA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (general conditions for construction, operation and maintenance), the EPA shall ensure that:

    a. Timing of in-water work. In-water work will be completed between July 15th and August 31st during a period of time when presence of ESA-listed fish are low.

Downstream fish passage will be maintained throughout the project, however, the stream will likely have nearly no flow during construction

b. Cessation of work. Project operations will cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

c. Fish screens. All water intakes used for a project, including pumps used to isolate an in-water work area, will have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria.[1]

d. Fish passage. Passage will be provided for any adult or juvenile salmonid species present in the project area during construction, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

e. Pollution and Erosion Control Plan. A Pollution and Erosion Control Plan will be prepared and carried out to prevent pollution related to construction operations. The plan must be available for inspection on request by EPA or NOAA Fisheries.

   i. Plan Contents. The Pollution and Erosion Control Plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

      (1) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

      (2) Practices to confine, remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.

      (3) A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

      (4) A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

      (5) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

[1] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

ii. Inspection of erosion controls. During construction, all erosion controls must be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately.[2]

(1) If inspection shows that the erosion controls are ineffective, work crews must be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Sediment must be removed from erosion controls once it has reached 1/3 of the exposed height of the control.

f. Construction discharge water. All discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water) will be treated as follows.

i. Water quality. Facilities must be designed, built and maintained to collect and treat all construction discharge water using the best available technology applicable to site conditions. The treatment must remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities must not exceed 4-feet per second.

iii. Spawning areas, marine submerged vegetation. No construction discharge water may be released within 300 feet upstream of active spawning areas or areas with marine submerged vegetation.

g. Preconstruction activity. Before significant[3] alteration of the project area, the following actions must be completed.

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[4]).

(2) An oil-absorbing, floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls must be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

h. Temporary access roads.

i. Existing ways. Existing roadways or travel paths must be used whenever possible, unless construction of a new way would result in less habitat take.

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[2] "Working adequately" means no turbidity plumes are evident during any part of the year.

[3] "Significant" means an effect can be meaningfully measured, detected or evaluated.

[4] When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

ii. Steep slopes. Temporary roads built mid-slope or on slopes steeper than 30 percent are not authorized.

iii. Minimizing soil disturbance and compaction. When a new temporary road is necessary within 150 feet[5] of a stream, waterbody or wetland, soil disturbance and compaction must be minimized by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries.

iv. Temporary stream crossings.

(1) The number of temporary stream crossings must be minimized.

(2) Temporary road crossings must be designed as follows.

(a) A survey must identify and map any potential spawning habitat within 300 feet downstream of a proposed crossing.

(b) No stream crossing may occur at known or suspected spawning areas, or within 300 feet upstream of such areas if spawning areas may be affected.

(c) The crossing design must provide for foreseeable risks (*e.g.*, flooding and associated bedload and debris) to prevent the diversion of streamflow out of the channel and down the road if the crossing fails.

(d) Vehicles and machinery must cross riparian areas and streams at right angles to the main channel wherever possible.

v. Obliteration. When the project is completed, all temporary access roads must be obliterated, the soil must be stabilized, and the site must be revegetated. Temporary roads in wet or flooded areas must be abandoned and restored as necessary by the end of the in-water work period.

i. Heavy Equipment. Use of heavy equipment will be restricted as follows.

i. Choice of equipment. When heavy equipment must be used, the equipment selected must have the least adverse effects on the environment (*e.g.*, minimally sized, rubber tired).

ii. Vehicle staging. Vehicles must be fueled, operated, maintained and stored as follows:

(1) Vehicle staging, cleaning, maintenance, refueling, and fuel storage must take place in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland.

(2) All vehicles operated within 150 feet of any stream, waterbody or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the

[5] Distances from a stream or waterbody are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. "Channel migration zone" means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years, *e.g.*, alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams.

vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request by EPA or NOAA Fisheries.

(3) All equipment operated instream must be cleaned before beginning operations below the bankfull elevation to remove all external oil, grease, dirt, and mud.

iii. Stationary power equipment. Stationary power equipment (*e.g.*, generators, cranes) operated within 150 feet of any stream, waterbody or wetland must be diapered to prevent leaks, unless otherwise approved in writing by NOAA Fisheries.

j. Site preparation. Native materials will be conserved for site restoration.

i. If possible, native materials must be left where they are found.

ii. Materials that are moved, damaged or destroyed must be replaced with a functional equivalent during site restoration.

iii. Any large wood[6], native vegetation, weed-free topsoil, and native channel material displaced by construction must be stockpiled for use during site restoration.

k. Isolation of in-water work area. If adult or juvenile fish are reasonably certain to be present, the work area will be well isolated from the active flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials. The work area will also be isolated if in-water work may occur within 300 feet upstream of spawning habitats.

l. Capture and release. Before and intermittently during pumping to isolate an in-water work area, an attempt must be made to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.

i. A fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish must conduct or supervise the entire capture and release operation.

ii. If electrofishing equipment is used to capture fish, the capture team must comply with NOAA Fisheries' electrofishing guidelines.[7]

iii. The capture team must handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

iv. Captured fish must be released as near as possible to capture sites.

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[6] For purposes of this Opinion only, "large wood" means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

[7] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

v. ESA-listed fish may not be transferred to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

vi. Other Federal, state, and local permits necessary to conduct the capture and release activity must be obtained.

vii. NOAA Fisheries or its designated representative must be allowed to accompany the capture team during the capture and release activity, and must be allowed to inspect the team's capture and release records and facilities.

m. Earthwork. Earthwork (including drilling, excavation, dredging, filling and compacting) will be completed as quickly as possible.

i. Site stabilization. All disturbed areas must be stabilized, including obliteration of temporary roads, within 12 hours of any break in work unless construction will resume work within 7 days between June 1 and September 30, or within 2 days between October 1 and May 31.

ii. Source of materials. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained outside the riparian area.

n. Site restoration. All streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows.

i. Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (such as large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

ii. Streambank shaping. Damaged streambanks must be restored to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation.

iii. Revegetation. Areas requiring revegetation must be replanted before the first April 15 following construction with a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees.

iv. Pesticides. No pesticide application is allowed, although mechanical or other methods may be used to control weeds and unwanted vegetation.

v. Fertilizer. No surface application of fertilizer may occur within 50-feet of any stream channel.

vi. Fencing. Fencing must be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

o. Stormwater management. Prepare and carry out a stormwater management plan that slows the entry of water into the soil. The plan must be available for inspection on request by NOAA Fisheries.

i. Plan contents. The goal is to avoid and minimize adverse effects due to the quantity and quality of stormwater runoff for the life of the project by maintaining or restoring natural runoff conditions. The plan will meet the following criteria and contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(1) A system of management practices and, if necessary, structural facilities, designed to complete the following functions:
   (a) Minimize, disperse and infiltrate stormwater runoff onsite using sheet flow across permeable vegetated areas to the maximum extent possible without causing flooding, erosion impacts, or long-term adverse effects to groundwater.
   (b) Pretreat stormwater from pollution generating surfaces, including bridge decks, before infiltration or discharge into a freshwater system, as necessary to minimize any nonpoint source pollutant (*e.g.*, debris, sediment, nutrients, petroleum hydrocarbons, metals) likely to be present in the volume of runoff predicted from a 6-month, 24-hour storm.[8]
   (c) Ensure that the duration of post project discharge matches the pre-developed discharge rates from 50% of the 2-year peak flow up to the 50-year peak flow.

(2) If engineered facilities are used to meet stormwater requirements, use a continuous rainfall/runoff model, if available for the project area, to calculate stormwater facility water quality and flow control rates.

(3) Use permeable pavements for load-bearing surfaces, including multiple-use trails, to the maximum extent feasible based on soil, slope, and traffic conditions.

(4) Install structural facilities outside wetlands or the riparian buffer area[9] whenever feasible, otherwise, provide compensatory mitigation to offset any long-term adverse effects.

(5) Document completion of the following activities according to a regular schedule for the operation, inspection and maintenance of all structural facilities and conveyance systems, in a log available for inspection on request by the Corps and NOAA Fisheries.
   (a) Inspect and clean each facility as necessary to ensure that the design capacity is not exceeded, heavy sediment discharges

[8] A 6-month, 24-hour storm may be assumed to be 72% of the 2-year, 24-hour amount. See, Washington State Department of Ecology (2001), Appendix I-B-1.

[9] For purposes of this Opinion only, 'riparian buffer area' means land: (1) Within 150 feet of any natural water occupied by listed salmonids during any part of the year or designated as critical habitat; (2) within 100 feet of any natural water within 1/4 mile upstream of areas occupied by listed salmonids or designated as critical habitat and that is physically connected by an above-ground channel system such that water, sediment, or woody material delivered to such waters will eventually be delivered to water occupied by listed salmon or designated as critical habitat; and (3) within 50 feet of any natural water upstream of areas occupied by listed salmonids or designated as critical habitat and that is physically connected by an above-ground channel system such that water, sediment, or woody material delivered to such waters will eventually be delivered to water occupied by listed salmon or designated as critical habitat. 'Natural water' means all perennial or seasonal waters except water conveyance systems that are artificially constructed and actively maintained for irrigation.

are prevented, and whether improvements in operation and maintenance are needed.

(b) Promptly repair any deterioration threatening the effectiveness of any facility.

(c) Post and maintain a warning sign on or next to any storm drain inlet that says, as appropriate for the receiving water, 'Dump No Waste - Drains to Ground Water, Streams, or Lakes.'

(d) Only dispose of sediment and liquid from any catch basin in an approved facility.

ii. Runoffs/discharge into a freshwater system. When stormwater runoff will be discharged directly into fresh surface water or a wetland, or indirectly through a conveyance system, the following requirements apply.

(1) Maintain natural drainage patterns and, whenever possible, ensure that discharges from the project site occur at the natural location.

(2) Use a conveyance system comprised entirely of manufactured elements (*e.g.*, pipes, ditches, outfall protection) that extends to the ordinary high water line of the receiving water.

(3) Stabilize any erodible elements of this system as necessary to prevent erosion.

(4) Do not divert surface water from, or increase discharge to, an existing wetland if that will cause a significant adverse effect to wetland hydrology, soils or vegetation.

(5) The velocity of discharge water released from an outfall or diffuser port may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

2. To implement reasonable and prudent measure #2 (monitoring and reporting), the EPA shall ensure that:

a. Within 120 days of completing the project, the EPA shall ensure submital of a monitoring report to NOAA Fisheries describing the applicants success meeting their permit conditions. This report will consist of the following information.

i. Project identification.

(1) Project name.

(2) Starting and ending dates of work completed for this project.

(3) The EPA contact person.

ii. Isolation of in-water work area. A report of any seine and release activity including:

(1) The name and address of the supervisory fish biologist.

(2) Methods used to isolate the work area and minimize disturbances to fish species.

(3) Stream conditions prior to and following placement and removal of barriers.

(4) The means of fish removal.
(5) The number of fish removed by species.
(6) The location and condition of all fish released.
(7) Any incidence of observed injury or mortality.

iii. Pollution and erosion control. A summary of all pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.

iv. Site restoration. Documentation of the following conditions:
(1) Finished grade slopes and elevations.
(2) Log and rock structure elevations, orientation, and anchoring, if any.
(3) Any changes in planting composition and density.
(4) A plan to inspect and, if necessary, replace failed plantings and structures, including the compensatory mitigation site.

v. Photographic documentation of environmental conditions at the project site before, during and after project completion.
(1) Photographs will include general project location views and close-ups showing details of the project area and project, including pre- and post-construction.
(2) Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
(3) Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

vi. Monitoring. On an annual basis for 5 years after completing the project, the EPA shall ensure submital of a monitoring report to NOAA Fisheries describing the applicant's success in meeting their habitat restoration goals of any riparian plantings. This report will consist of the following information:
(1) Project identification.
(a) Project name.
(b) Starting and ending dates of work completed for this project.
(c) The EPA contact person.
(2) Riparian restoration. Documentation of the following conditions:
(a) Any changes in planting composition and density.
(b) A plan to inspect and, if necessary, replace failed plantings and structures.
(3) Each spring for a period of five years, the applicant shall assess the bankline downstream of the bridge to determine if stream hydrology has been altered due to wing wall placement resulting in streambank slumping or erosion. Any bankline erosion or sloughing caused by altered hydrology shall be restored by the applicant using

appropriate bioengineering techniques. Results of these assessments shall be included in the monitoring report described below.

b. NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

3. MAGNUSON-STEVENS ACT

3.1 Background

The objective of the essential fish habitat (EFH) consultation is to determine whether the proposed actions may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;

- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH;

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.3 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for Federally-managed fisheries within the waters of Washington, Oregon, and California. Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999).

Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed action is based on this information.

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.4 Proposed Action

The proposed action is detailed above in Part 1.2. The action area for this consultation includes the streambed and streambank of Foster Creek extending upstream 100 feet and downstream an additional 300 feet. This area has been designated as EFH for chinook and coho salmon.

3.5 Effects of Proposed Action

NOAA Fisheries believes the implementation of the bridge replacement project is likely to adversely affect EFH for chinook and coho salmon. Information submitted by the EPA in its request for consultation is sufficient for NOAA Fisheries to conclude that the effects of the proposed action are transient, local, and of low intensity and are likely to adversely EFH in the short term.

3.6 Conclusion

NOAA Fisheries believes that implementation of the proposed project in Foster Creek will adversely affect designated EFH for chinook salmon.

3.7 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project in the BA by the EPA, all of the Reasonable and Prudent Measures and the Terms and Conditions contained in sections 2.2.2 and 2.2.3, respectively, are applicable to EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.8 Statutory Response Requirement

Please note that the MSA(section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.9 Supplemental Consultation

The EPA must reinitiate EFH consultation with NOAA Fisheries if either the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion.

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